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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SMITH, CHAIM A

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,921	Applicant(s) MUTSAERS ET AL.	
	Examiner CHAIM SMITH	Art Unit 1782	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/19/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 July 2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 4 - 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hass US 1,957,336 in view of Zorn, Applied Microbiology and Biotechnology 62:331 - 336, 2003.

5. Regarding claim 1, Hass discloses a process for the production of a food product (dough) (page 2, ln 48) wherein an intermediate form of said food product comprises a pigment (yellow carotin) (page 2, ln 98). The intermediate form of the food product is contacted with at least one enzyme for which the pigment is a substrate under

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conditions such that at least a portion of said pigment present in the intermediate form of said food product is converted (page 1, ln 5 – 10) by said at least one enzyme (active bleaching or carotin-removing enzymes) (page 2, ln 100 – 101) into a form such that the whiteness of at least part of said intermediate form of said food product is increased (page 1, ln 5 – 10) and said food product is thereby prepared (process of making bread) (title and claim 1). Further Hass discloses that enzymes from sources other than those disclosed would also be effective in bleaching food products page 2, ln 50 – 55).

6. Hass differs from claim 1 in specifying the enzyme is a direct conversion enzyme. Zorn discloses the bleaching of β -carotene (degradation) can be accomplished by the use of fungal enzymes. In order to determine which fungal source enzymes would provide optimal bleaching activity (degradation) in β -carotene Zorn measured said activity by a conventional photometric bleaching test in which the enzymatic activities were measured by the amount of bleaching (degradation) occurring in β - carotene. Zorn therefore discloses that is, it is conventional and known in the art that carotenoids are bleached by fungal based enzymes. *M. scorodoni* in particular was characterized by Zorn as having a high activity with respect to the degradation of β - carotene (Zorn; abstract, page 333, col. 2, paragraph 3, table 1 and page 334, col. 1, bottom of the page, table 2). While Zorn is cleaving β - carotene to derive flavor compounds Zorn discloses that it is known in the art that the bleaching of carotenoids can be accomplished using fungal based enzymes which is applicant's intended function. Once it was known that a particular enzyme would bleach carotenoids the substitution of one conventional enzyme known to bleach carotenoids for another conventional

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enzyme known to bleach carotenoids is seen to have been an obvious matter of choice and/or an obvious result effective variable, particularly if higher activities were known to be present in one variety over another as is seen in table 2 of Zorn. To therefore modify Hass and use a direct converting enzyme to bleach a food product would have been an obvious matter of choice and/or an obvious result effective variable. An express suggestion to substitute one equivalent component for another is not necessary to render such substitution obvious (MPEP 2144.06 II.).

7. Regarding claim 2, both and Zorn disclose the food product is made from flour ('336; page 2, ln 15).

8. Regarding claim 4, Hass in view of Zorn discloses the pigment is a carotenoid (yellow carotin) ('336; page 2, ln 98) (β -carotene) (Zorn; abstract).

9. Regarding claims 5, 6, 7, and 12 Hass in view of Zorn discloses the enzyme is added as an enzyme preparation derived from a microorganism or produced in situ by a microorganism, that is, in particular *Marasmius scorodoni* (Zorn; abstract) which is a fungus (Zorn; page 331, paragraph 3),.

10. Regarding claims 8 and 9, since Hass in view of Zorn discloses a method of making a food product by the process according to claim 1 (bread) ('336; title) it is expected that the product would have been made. Further Hass discloses that the at least one part of the food product has been subjected to treatment with an enzyme according to the process of claim 1 ('336; page 2, ln 12 – 54).

11. Regarding claim 11, Hass in view of Zorn discloses the use of wheat flour ('336; page 2, ln 122).

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12. Claims 1, 2, 4 – 9, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugio et al. WO 02/086114 in view of Zorn, Applied Microbiology and Biotechnology 62:331 - 336, 2003.

13. Regarding claim 1, Sugio discloses a process for the production of a food product (flour for bread) (page 4, ln 23) wherein an intermediate form of said food product comprises a pigment (carotenoids) (page 4, ln 15 - 16). The intermediate form of the food product is contacted with at least one enzyme for which the pigment is a substrate under conditions such that at least a portion of said pigment present in the intermediate form of said food product is converted by said at least one enzyme (lipoxygenase) into a form such that the whiteness of at least part of said intermediate form of said food product is increased (bleaching). Sugio discloses that the enzyme would be used for bleaching of flour for bread and said food product is thereby prepared (bleaching of flour) (page 4, ln 22 - 24).

14. Claim 1 differs from Sugio in specifying the enzyme is a direct conversion enzyme. Zorn discloses the bleaching of β -carotene (degradation) can be accomplished by the use of fungal enzymes. In order to determine which fungal source enzymes would provide optimal bleaching activity (degradation) in β -carotene Zorn measured said activity by a conventional photometric bleaching test in which the enzymatic activities were measured by the amount of bleaching (degradation) occurring in β -carotene. Zorn therefore discloses that is, it is conventional and known in the art that carotenoids are bleached by fungal based enzymes. *M. scorodoni* in particular was characterized by Zorn as having a high activity with respect to the degradation of β -

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carotene (Zorn; abstract, page 333, col. 2, paragraph 3, table 1 and page 334, col. 1, bottom of the page, table 2). While Zorn is cleaving β - carotene to derive flavor compounds Zorn discloses that it is known in the art that the bleaching of carotenoids can be accomplished using fungal based enzymes which is applicant's intended function. Once it was known that a particular fungal enzyme would bleach carotenoids the substitution of one conventional fungal enzyme known to bleach carotenoids for another fungal enzyme known to bleach carotenoids is seen to have been an obvious matter of choice and/or an obvious result effective variable, particularly if higher activities were known to be present in one variety over another as is seen in table 2 of Zorn. To therefore modify Sugio and use a direct converting enzyme to bleach a food product would have been an obvious matter of choice and/or an obvious result effective variable. An express suggestion to substitute one equivalent component for another is not necessary to render such substitution obvious (MPEP 2144.06 II.).

15. Regarding claim 2, Sugio in view of Zorn discloses the food product would be made from flour (flour for bread) ('114; page 4, ln 22 – 24).

16. Regarding claim 4, Sugio in view of Zorn discloses the pigment is a carotenoid ('114; page 4, ln 22 – 24).

17. Regarding claims 5 and 6, Sugio in view of Zorn discloses the enzyme is added as an enzyme preparation derived from a microorganism (filamentous fungus) ('114; page 2, ln 20 – 30).

18. Claims 7 and 12 differ from Sugio in the particular fungal enzyme source used. Zorn discloses the enzyme is added as an enzyme preparation derived from a

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microorganism or produced in situ by a microorganism, that is, in particular *Marasmius scorodonius* (Zorn; abstract) which is a fungus (Zorn; page 331, paragraph 3).

19. Regarding claims 8 and 9, Sugio in view of Zorn discloses the enzyme would be used for bleaching flour for bread, said flour being a food product which would be made from the process as claimed and disclosed by Sugio ('114; page 4, 14 – 24).

20. Regarding claim 13, Sugio discloses that it would be conventional to use enzymes in household detergents ('114; page 4, 35 – 37). Claim 13 differs from Sugio in the use of a direct converting enzyme. Zorn is applied for the same reasons as above in the rejection of claim 1 to teach the conventionality of using direct converting enzymes for bleaching. To therefore modify the detergent of Sugio and use an enzyme that would directly convert pigments to a form such that the whiteness of an article would be increased would have been an obvious matter of choice and/or a result effective variable.

21. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugio et al. WO 02/086114 in view of Zorn, *Applied Microbiology and Biotechnology* 62:331 - 336, 2003 as further evidenced by Depew (*One Hundred Years of American Commerce* 1795 – 1895).

22. Regarding claim 14 Sugio discloses the conventionality of using enzymes to bleach textile dyes ('114; page 4, 35 – 37), which is the purpose of a stone bleach process. Claim 14 differs from Sugio in the use of a direct converting enzyme. Zorn is applied for the same reasons as above in the rejection of claim 1 to teach the conventionality of using direct converting enzymes for bleaching. To therefore modify a

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bleaching process as disclosed by Sugio and use an enzyme that would directly convert pigments to a form such that the whiteness of an article would be increased would have been an obvious matter of choice and/or a result effective variable. Regarding stone bleaching, the particular bleaching process used would have been an obvious matter of choice. Further as evidenced by Depew, stone bleaching is notoriously old (page 304, col. 2, ln 11 - 12).

23. Claims 1, 3, 4 – 9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roos et al. WO 2005/004616 in view of Zorn, Applied Microbiology and Biotechnology 62:331 - 336, 2003.

24. The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). The rejection might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another”, or by an appropriate showing under 37 CFR 1.131.

25. Regarding claim 1, Roos discloses a process for the production of a food product (cheese) (page 2, ln 30 - 32) wherein an intermediate form of said food product comprises a pigment (β - carotene). The intermediate form of the food product is contacted with at least one enzyme for which the pigment is a substrate under conditions such that at least a portion of said pigment present in the intermediate form of said food product is converted by said at least one enzyme (lipoxygenase) into a form such that the whiteness of at least part of said intermediate form of said food product is

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increased (bleaching). Roos discloses that the enzyme would be used for whitening in dairy products and said food product is thereby prepared (whitening) (page 3, ln 1 - 33).

26. Roos differs from claim 1 in specifying the enzyme is a direct conversion enzyme. Zorn discloses the bleaching of β -carotene (degradation) can be accomplished by the use of fungal enzymes. In order to determine which fungal source enzymes would provide optimal bleaching activity (degradation) in β -carotene Zorn measured said activity by a conventional photometric bleaching test in which the enzymatic activities were measured by the amount of bleaching (degradation) occurring in β -carotene. Zorn therefore discloses that is, it is conventional and known in the art that carotenoids are bleached by fungal based enzymes. *M. scorodoni* in particular was characterized by Zorn as having a high activity with respect to the degradation of β -carotene (Zorn; abstract, page 333, col. 2, paragraph 3, table 1 and page 334, col. 1, bottom of the page, table 2). While Zorn is cleaving β -carotene to derive flavor compounds Zorn discloses that it is known in the art that the bleaching of carotenoids can be accomplished using fungal based enzymes which is applicant's intended function. Once it was known that a particular fungal enzyme would bleach carotenoids the substitution of one conventional enzyme known to bleach carotenoids for another enzyme known to bleach carotenoids is seen to have been an obvious matter of choice and/or an obvious result effective variable, particularly if higher activities were known to be present in one variety over another as is seen in table 2 of Zorn. To therefore modify Roos and use a direct converting enzyme to bleach a food product would have been an obvious matter of choice and/or an obvious result effective variable. An express

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suggestion to substitute one equivalent component for another is not necessary to render such substitution obvious (MPEP 2144.06 II.).

27. Regarding claim 3, Roos in view of Zorn discloses the food product is a dairy product ('616; page 3, ln 28 - 33).

28. Regarding claim 4, Roos in view of Zorn discloses the pigment is a carotenoid (β -carotene) ('616; page 3, ln 5).

29. Regarding claims 5 and 6, Roos in view of Zorn discloses the enzyme is added as an enzyme preparation derived from a microorganism (suitable sources, fungus) ('616; page 3, ln 14 – 21).

30. Claims 7 and 12 differ from Roos in the particular fungal enzyme source used. Zorn discloses the enzyme is added as an enzyme preparation derived from a microorganism or produced in situ by a microorganism, that is, in particular *Marasmius scorodonius* (Zorn; abstract) which is a fungus (Zorn; page 331, paragraph 3).

31. Regarding claims 8 and 9, Roos in view of Zorn discloses a food product (cheese) made according to the method as claimed ('616; example 3 and 5).

Response to Arguments

32. Applicant's arguments filed 19 July have been fully and carefully considered but they are not persuasive.

33. Applicants urge “that it is very likely that the bleaching agent of Haas is a lipoxxygenase”. This urging is not deemed persuasive. Haas comes to teach that the use of enzymes in the bleaching of food products is old and well established.

Regarding the use of a particular enzyme by Haas, applicant is engaging in speculation

since Haas does not disclose any specific enzyme or bleaching agent. It is also noted that applicants' neither disclose nor claim the use of any specific enzyme as well, only the use of an enzyme preparation and contacting a food intermediate with at least one unnamed and therefore unknown enzyme. While applicants mention two specific enzymes that would be capable of direct cleavage of carotenoids in their disclosure, these enzymes are not disclosed nor claimed as being used in the claimed process.

34. Applicants urge that Zorn "allegedly" discloses the "direct" cleavage of a pigment, such as β -carotene. Applicants further urge that Zorn is only directed to flavor compounds. These urgings are not deemed persuasive. In response to applicant's urgings that Zorn is only directed to flavor compounds, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

35. Zorn discloses the use of an enzyme preparation based on *Marasmius scorodoni* and that nearly complete degradation, that is, bleaching of carotenoids around the fungus was observed. Only after it was determined that the enzyme preparation was well suited to the bleaching of carotenoids were further tests performed with respect to flavor compounds. That is to say both Zorn and the applicants are using an enzyme preparation prepared from the same fungus for the same purpose, which is to cleave carotenoids causing a bleaching effect. It is therefore unclear how the same enzyme preparation would directly cleave carotenoids in one instance and not the other

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as applicants' seem to assert. Further applicants "suggest" that it is statutorily unobviousness to whiten food by direct enzymatic as claimed. Here applicants are seen to be stating an opinion.

Conclusion

36. This is a Request for Continued Examination of applicant's earlier Application No. 10584921. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

37. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAIM SMITH whose telephone number is (571)270-7369. The examiner can normally be reached on Monday-Thursday 7:30-5:00.

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39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S./
Chaim Smith
Examiner, Art Unit 1782
04 January 2011

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1782